FEMA 269: 360285

FLOOD INSURANCE STUDY

VILLAGE OF ATHENS, NEW YORK
GREENE COUNTY

SEPTEMBER 6, 1989

Federal Emergency Management Agency

COMMUNITY NUMBER · 360285

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Flood Insurance Study Effective Date: September 6, 1989

Flood Insurance Study Revised:

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FLOOD INSURANCE STUDY
VILLAGE OF ATHENS, GREENE COUNTY, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates a previous Flood Insurance Study/Flood Insurance Rate Map for the Village of Athens, Greene County, New York. This information will be used by the Village of Athens to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study represent a revision of the original study. The hydrologic and hydraulic analyses in this study were prepared by McCoy-Jackson Associates for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-84-C-1603. This work was completed in October 1987.

1.3 Coordination

In March 1984, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the village, and McCoy-Jackson Associates (the study contractor). The meeting established flooding sources that would be studied by detailed methods.

Information concerning the history of flooding in the study area was provided by community officials and residents, the New York State Department of Environmental Conservation (DEC), and the U. S. Geological Survey (USGS).

On September 26, 1988, a final CCO meeting was held with representatives of FEMA, the village, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Athens, Greene County, New York. The area of study is shown on the Vicinity Map (Figure 1).

The following flooding sources were studied by detailed methods: the Hudson River, for its entire length within the community; and Sleepy Hollow Lake, for its entire shoreline within the community. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

2.2 Community Description

The Village of Athens is located on the eastern edge of Greene County in the capitol district of New York State. It is bordered by the Town of Greenport and the City of Hudson to the east; and the Town of Athens on all remaining sides. The village occupies an area of approximately 4.4 square miles. The 1980 population of Athens was 1,738 (Reference 1).

The Hudson River flows in a southern direction emptying into the Upper Bay at New York City. The river is an estuary in the vicinity of Athens and is used for navigation to connect New York Harbor with the Erie Canal to Buffalo and the Great Lakes. The Hudson River was studied for its entire length within the Village of Athens.

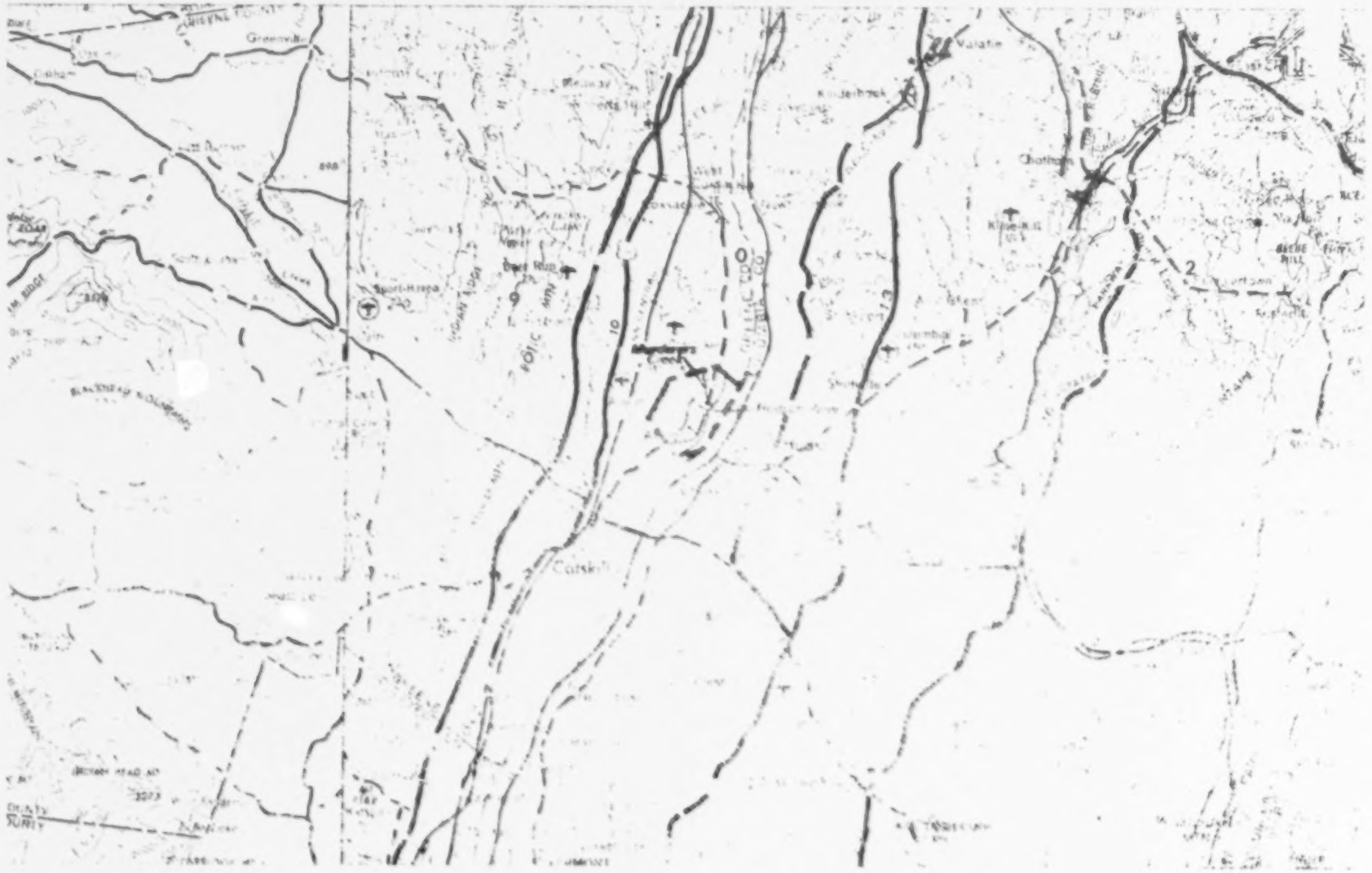
The climate of the area is characterized by moderately warm summers and cold winters. The mean July temperatures is approximately 73 degrees Fahrenheit (^{o}F), while the mean January temperature is approximately 29^{o}F. The mean annual precipitation over the region is approximately 37.0 inches. Precipitation in the form of snowfall and sleet occurs mainly in the months of December through March with an average annual snowfall of approximately 43 inches (Reference 2).

2.3 Principal Flood Problems

Flooding can occur in the study area during all seasons, but generally the most notable floods have occurred between the months of February and April when snowmelt adds to heavy spring rains to produce increased runoff. Summer and fall floods also occur due to hurricane activity.

2.4 Flood Protection Measures

There are no flood protection measures located within the Village of Athens. The Sleepy Hollow Lake is regulated by a fixed spillway and has only a small capability to attenuate major peak flood flows.


Greenville
Catskill
Durham
Coxsackie
Athens
Cairo
Greene County
Greene County Airport
Blackhead Mountains
Blackhead Mountain Road
Old Rte 9W
Rte 9W
Rte 23
Rte 32
Rte 385
Rte 81
Rte 145
Rte 385
Rte 23
Rte 32

Non-structural measures of flood protection are being utilized to aid in the prevention of future flood damage. These measures are in the from of land use regulations, which control building within areas that have a high risk of flooding.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency and peak elevation-frequency relationships for each flooding source studied in detail affecting the community.

Because the Hudson River is an estuary and tidal flood elevations are greater than those resulting from fluvial flows, peak discharges for the Hudson River were not computed.

The stillwater elevations for the 10-, 50-, 100-, 500-year floods have been determined for the Hudson River and Sleepy Hollow Lake and are summarized in Table 1, "Summary of Stillwater Elevations."

TABLE 1 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
HUDSON RIVER				
At the downstream corporate limits	8.1	10.5	11.6	14.3
At the upstream corporate limits	8.5	11.1	12.2	15.5

TABLE 1 - SUMMARY OF STILLWATER ELEVATIONS - continued

FLOODING SOURCE AND LOCATION	ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
SLEEPY HOLLOW LAKE				
Entire shoreline	71.8	72.9	73.5	75.3

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

For the Hudson River, tidal elevations of floods of the selected recurrence intervals were linearly interpolated between the upstream elevations obtained from the Flood Insurance Study for the Town of Stockport and the downstream elevations obtained from the Flood Insurance Study for the Town of Saugerties (References 3 and 4).

Flood elevations on Sleepy Hollow Lake were obtained from an analysis report prepared by the U. S. Army Corps of Engineers (COE) (Reference 5). The normal pool elevation of the Lake is 70.0 feet.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 2).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the flooding sources studied in detail, the 100- and 500-year floodplain boundaries have been delineated using aerial photographs at a scale of 1:9,600 and topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (References 6 and 7).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 1). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zone AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

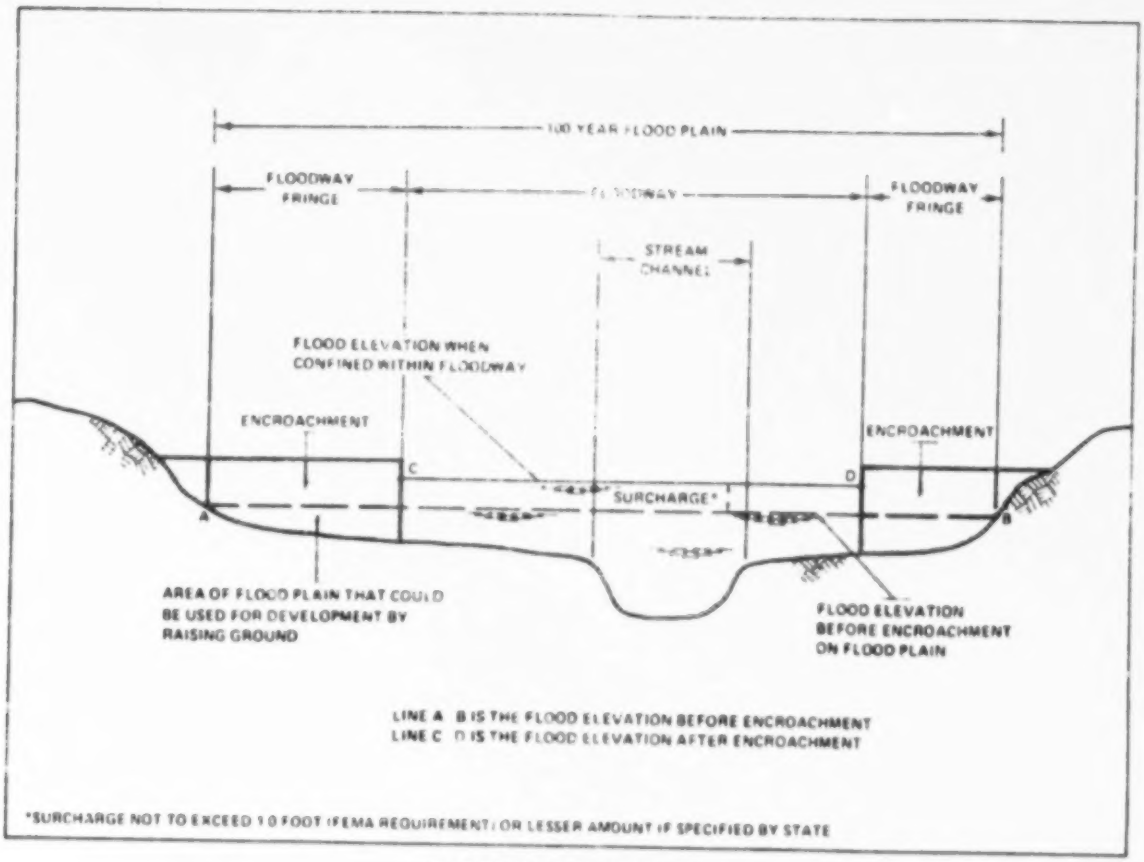
Because the Hudson River is a tidal estuary in the vicinity of Athens, no floodway was computed.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC Figure 2

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map (FIRM) is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies are currently being prepared for the Towns of Athens and Greenport, and the City of Hudson (References 8, 9, and 10). The results of this study are in complete agreement with the results of those studies.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, New York, Washington D. C., U. S. Government Printing Office, 1981.

2. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Center, Climatography of the United States No. 20, Asheville, North Carolina, December 1975.

3. Federal Emergency Management Agency, Flood Insurance Study, Town of Stockport, Columbia County, New York, Washington, D. C., January 19, 1983.

4. Federal Emergency Management Agency, Flood Insurance Study, Town of Saugerties, Ulster County, New York, Washington, D. C., August 5, 1985.

5. U. S. Army Corps of Engineers, New York District, Phase I Inspection Report, Sleepy Hollow Dam, Village of Athens, Greene County, New York, New York, 1978.

6. Geomaps, Inc. of Mineola, aerial photographs, Scale 1:9,600: Village of Athens, New York, flown in March 1985.

7. Geomaps, Inc. of Mineola, topographic maps compiled from aerial photographs, Scale 1:4,800, Contour Interval 4 Feet: Village of Athens, New York, flown in March 1985.

8. Federal Emergency Management Agency, Flood Insurance Study, Town of Athens, Greene County, New York (Unpublished).

9. Federal Emergency Management Agency, Flood Insurance Study, Town of Greenport, Columbia County, New York (Unpublished).

10. Federal Emergency Management Agency, Flood Insurance Study, City of Hudson, Columbia County, New York (Unpublished).

U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Hudson North, New York, Hudson South, New York.

Ven Te Chow, Open-Channel Hydraulics, New York, McGraw-Hill, 1959.

U. S. Department of Commerce, Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D. C., 1961, Revised 1963.

EXHIBIT 2 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 1	02	102.69	Large P.K. nail set approximately 1.0 foot up utility pole No. 118924, on northeast side of Union Street at intersection of Vernon Street.
RM 2	02	89.64	Large P.K. nail set approximately 1.0 foot up utility pole No. 1226565 at east corner of T-intersection of State Route 74, State Route 28, and Second Avenue.